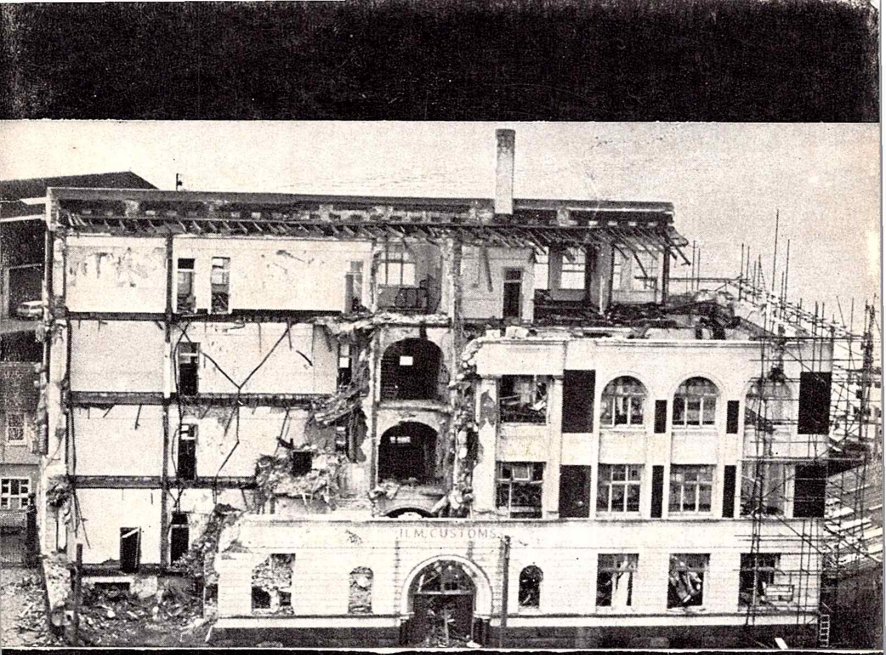

SAFETY IN CONSTRUCTION

No. 23

Demolition Guide

issued by the department of labour · new zealand

Safety in Construction

No. 23

DEMOLITION GUIDE

for

BUILDING AND ENGINEERING WORK

UNDER THE CONSTRUCTION ACT 1959

Prepared in the office

of

the Chief Safety Engineer

Department of Labour

FOREWORD

The purpose of this guide is to assist employers, supervisors and others in charge of demolition work to obtain a better understanding of the safety requirements as laid down under the Construction Act and Regulations and to advise employers on safe practices.

Although it has in the past been generally accepted that all construction works need skilled personnel to supervise the erection of multi-storey buildings and engineering works, it has also been generally accepted that anybody from any walk of life can tender and win a contract for the demolition of buildings in busy city areas, bridges over deep gorges or rivers, and similar works.

They proceed to employ unskilled labour, buy or hire some mechanical plant and commence operations knowing little or nothing of the safety requirements of the law, methods of procedure or the dangers involved. This has happened on many occasions in New Zealand and it has only been by the greatest good fortune that the death and injury toll has not been greater than it already is.

This guide is written with the intention of offering information to skilled as well as unskilled operators, and to bring to the notice of the employers, supervisors and workmen, the requirements of the law and safe methods which, if followed will provide reasonable safety of life, limb and property.

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Chief Safety Engineer.

Department of Labour,
March, 1974.

Wellington, N.Z.

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Chapter 1

DEFINITIONS

1.1.00 **Allowable Floor Load**

This is the maximum load a floor can support safely. If strength of floor is unknown have a registered engineer inspect and certify the maximum safe working load.

1.1.01 **Approved**

Either by the Chief Safety Engineer or a Safety Inspector.

1.1.02 **Brittle Roofing**

Roofing material that cannot safely withstand the weight of a person and includes corrugated, flat or troughed asbestos, perspex, plastic material, pinex, woodtex or corroded galvanised iron.

1.1.03 **Chute**

A trough or tube used to guide and transport sliding objects, material or debris, from a higher to a lower level. Any chute should be so designed that no spillage occurs except at the delivery point.

1.1.04 **Demolition**

Is the razing, destroying or wrecking of any fixed building or structure.

1.1.05 **Demolition Contractor**

A person, company or organisation, employed to carry out the demolition work. An employer within the meaning of section 2 of the Construction Act.

1.1.06 **Felling**

The collapse of a building or structure in such a manner that the debris falls in a predetermined area. Usually when one action or effort demolishes the building or structure.

1.1.07 **Personal Protective Equipment**

Is any, gloves, shoes, head protective helmets, clothing respiratory equipment, safety glasses, etc., designed to protect the workman from injury.

1.1.08 **Properly Qualified Person**

Are those who by possession of a recognised degree, certificate, or professional standing; or by extensive knowledge, training and experience have successfully demonstrated their ability to solve or resolve problems relating to demolition work.

1.1.09 **Safety Supervisor**

Is a person who holds a certificate of competency as a safety supervisor. To obtain this certificate the candidate must have had experience in the class of work sought, he must attend a course of instruction given by the Department of Labour, and pass a written examination set by the Chief Safety Engineer.

On all notifiable construction works a certificated safety supervisor must be appointed and remain at the site of the work to ensure that the provisions of the Act and Regulations are complied with.

1.1.10 **Sound and Accepted Engineering Practice**

Means engineering practice generally regarded as sound by those members of the engineering profession mainly concerned with the practice and accepted as such by the Chief Safety Engineer.

1.1.11 **Walkways**

Any part of the building or structure used by workmen to gain access or work thereon and includes stairways, temporary platforms, ladders, etc.

Chapter 2

LEGAL REQUIREMENTS

1.2.00 **Construction Act 1959**

Is an Act of the General Assembly to make better provision for the safety and welfare of persons engaged in the construction industry.

1.2.01 **Construction Work**

Includes demolition of any building, erection, edifice, structure, wall, fence, chimney, bridge, viaduct, dam or pipeline.

1.2.02 **Employers' Responsibility**

The employer is liable for the payment of wages or would be so liable if wages were paid, and to ensure that the provisions of the Act and Regulations are complied with.

On a demolition contract the employer must ensure that it is supervised by a properly qualified person, that safe access and egress is maintained throughout, that personal protective equipment is provided and used.

There must also be provided adequate supply of fresh drinking water, sanitary first-aid and washing facilities, and accommodation for meals and rest periods.

Protection of the public and persons lawfully in the vicinity must also be provided.

That all plant, tools and gear is adequate in strength, maintained in good order and operated by a competent person.

1.2.03 **Workman**

A workman must obey any lawful instruction, comply with the provisions of the Act and Regulations, and not do any act that is likely to endanger himself or others.

1.2.04 **Notifiable Construction Work**

Certain construction work is notifiable to the Department of Labour, those most likely to apply to demolition are work wherein workmen risk a fall of 15 feet or more, or work in which explosives are used or kept on the site for the purpose of being used. Any notifiable work must be notified 24 hours before the work commences.

It is a further requirement that notifiable work must be under the supervision of a safety supervisor who holds a certificate of competency granted in respect of the kind or class of work being carried out.

1.2.05 **Safety Inspectors**

Safety Inspectors are officers of the Department of Labour, whose principal function is to promote the safety and welfare of workmen engaged in construction work, to advise employers and workmen as to safe practices recommended in respect of construction work and to ensure that the provisions of the Construction Act are complied with.

Chaper 3

PLANNING

1.3.00 **Preliminary Investigations**

Prior to the commencement of any demolition work, a careful study must be made of the structure to be demolished, its proximity to adjacent buildings or property and the effect it will have on them. The following factors must be considered and allowed for by the employer.

1.3.01 **Adjoining Walls**

The removal of walls close against an adjoining building which can seriously affect the stability of that building, and the removal of foundations which can undermine and endanger neighbouring property if precautionary measures are not taken. Damage to those properties by mechanical plant, explosives or other means must be guarded against at all times. On reaching foundation stage, care must be

exercised regarding the support under adjoining buildings or vertical fences and where in doubt a professional engineer must be consulted. Where practicable, basement walls should be left remaining as these provide lateral support to the adjoining building. Special care shall be taken in demolishing structures, buildings and/or chimneys to ensure that no undue vibration or concussion is caused which could result in damage to other properties, underground services or drains, or damage to adjacent property by flying debris.

1.3.02 **Adjoining Streets**

The proximity of the structure to busy thoroughfares or streets can also retard the progress of the work and if not allowed for will encourage short-cut methods and consequent danger to workmen, public and property.

1.3.03 **Skills Required**

Consideration must be given to the skills required by workmen and supervision for that particular class of demolition work.

1.3.04 **Brick Buildings**

Brick buildings or structures pose special dangers as masonry may be perished or cracked, floor beams may protrude into walls, sections may have been added to the original.

Where floor beams protrude into walls, bricks should be removed from each side and above so that when the beam is removed it does not prematurely demolish the wall.

2.3.05 **Miscellaneous**

Other items to be allowed for are the unknown and uncertainties that are often present in old buildings or structures. Original construction plans are often missing or incomplete, what lies beyond the range of vision must be carefully thought out and established.

Unlike construction, where a building gains strength as it grows, in demolition a building becomes weaker as it comes down.

1.3.06 **Design Check**

During preliminary investigation, attention must be given to the nature of design and construction with particular reference to the following.

The roof and all framed structures, check whether unbalanced thrusts will occur. If the roof is of a brittle material no employer shall cause or permit any workman to walk over or work on, and no workman shall walk over or work on it unless there is affixed directly under the roofing adequate sarking, adequate metal mesh, or an approved safety net.

Check whether walls are load-bearing and the effect on the remaining structure of the removal of buttressing walls. Check whether the building has been damaged at any time by fire, earthquake or other causes sufficient to require temporary shoring or bracing during the demolition process. The removal of stressed concrete structures must be proceeded with, with caution after first ascertaining the system of stressing and construction use. Stressed beams always indicate load-bearing members and therefore principal components of a building.

Chapter 4

STRUCTURES

1.4.00 **Demolition Planning—Bridges**

The demolition of bridges particularly those of truss design must be carefully planned prior to the commencement of operations. The cutting of truss members by unskilled operators must not be permitted, cutting must be carried out by a properly qualified person under the direct supervision of an engineer or other qualified person. All bridge demolition work is hazardous in that most are over water or deep areas and unless completely demolished by explosives involve problems of lifting and removal. Generally, when hand demolition methods are employed, bridges should be dismantled in the reverse sequence to that in which they were erected. Work should commence by removing as much dead load as possible without interfering with the main structural members.

On a confined site, the section to be demolished should be supported by suitable lifting equipment, then cut and lowered to the ground.

1.4.01 **Demolition Planning—Steel Structures**

Where concrete or other casing has been removed from steel members and cutting is to begin precautions must be taken to prevent it swinging freely and possibly striking workmen or other parts of the structure. The riding of the member when being removed by crane or lifting device must not be permitted unless approval is given in writing by the Safety Inspector. A tag line shall be used on all hoisted or lowered loads. All gas-cutting to be carried out by a properly qualified person.

Chapter 5
WORK PLANNING

In planning demolition work the employer must make provision for:

1.5.00 **Permits, etc.**

A building permit from the Local Authority and notification to the Safety Inspector on form Lab. Const. 1 if the work is of a notifiable nature as outlined in Section 1 of this Guide.

1.5.01 **Scaffolding**

The need for scaffolding and if necessary its stability without attachment to the building.

The provision of gantries, and catch screens over the entire face of the scaffold if adjacent to a public street or neighbouring property. Catch screens must not be more than two lifts (4 metres) below the actual demolition work, they should be so constructed that any object that falls from above would be caught and held.

1.5.02 **Debris Disposal**

The provision of material chutes for the continued removal of rubbish from the site. The provision of footpath crossings and the tie up with the traffic authorities regarding the entry and exit points of trucks and mechanical plant to the site.

1.5.03 **Protection of Public**

The protection of workmen and the public at all times, the protection of property and the reduction of noise, dust and nuisance as much as practicable.

The provision of facilities for his workmen, and safe access and egress to every place at which any workman has at any time to work.

Chapter 6
PROTECTION OF PUBLIC AND PERSONS LAWFULLY IN THE VICINITY

1.6.00 **General**

Section 3 (2) of the Construction Act 1959 states that . . . "Any provision of this Act or of any regulations under this Act relating to the safety of workmen employed in construction work shall apply also to the safety of persons lawfully in the vicinity of the work, whether or not they are employed in the work." This means that the public walking or driving past and alongside any demolition work must be protected in the same way as are the workmen on the site.

1.6.01 **Overhead Protection**

Persons must be protected from falling objects, projections, dust, nuisance, mechanical plant including trucks entering and leaving the site, welding, cutting sparks and undue noise during extended working hours. The perimeter of the site must be closed or protected by scaffolding or protective fence. No walls, columns, chimneys or other structural members shall be left free standing whether on a street frontage or otherwise unless adequately supported against earthquake, shock, excessive wind or vibration.

1.6.02 **Sign-posting, etc.**

Warning signs must be placed at various points around the site advising the public that demolition work is in progress and danger exists. Flagmen must be stationed at truck entrance and exit points and during the hours of darkness warning lights must be placed at all danger areas. Where members of the public are permitted to remove demolition material from the site special safety precautions must be provided for.

All footpaths or thoroughfares adjacent to the work site open to the public must be kept clear, clean and unobstructed at all times. Roads kerbs and stormwater drains must be kept clear of material to prevent flooding.

1.6.03 **Disposal by Burning**

No debris shall be burned at the site unless permits are obtained from the Chief Fire Officer in the district.

Where gas-cutting is carried out or inflammable materials stored on the site a sufficient number of fire extinguishers shall be provided and shall be approved by the Chief Fire Officer.

Chapter 7
PROCEDURE

It is accepted that most demolition work is carried out as quickly as possible and with the least cost. This, however, must be commensurate with the safety of the workers and the public. To achieve this purpose a proper planned procedure must be adhered to.

1.7.00 **Services—Gas, etc.**

All services such as gas, water, electricity, drains, cables, etc., must be cut off and plugged outside the building line. The appropriate authority must be advised where services inter-connect with adjoining buildings.

1.7.01 **Scaffolding**

Where scaffolding is necessary it must be suitable and sufficient and be provided where work cannot be carried out safely by other means.

Scaffolding shall be of a kind suitable for the purpose for which it is used, properly constructed of sound material, and constructed with a sufficient reserve of strength having regard to the loads and stresses to which it may be subjected.

Scaffolding chairs over 25 feet in height, swinging stages or boatswain's chairs shall not be erected, altered, interfered with or dismantled except by a competent workman under the charge of a person having such qualifications as may be so prescribed.

Scaffolding to which the preceding paragraph of this section applies shall be examined in accordance with and at such times as may be prescribed by regulations under this Act and a record of all such examinations shall be kept by the employer and the record shall be available for inspection by the Inspector at the site of the work.

Where scaffolding is used for demolition work it must be designed to carry the loads placed upon it during the demolition process plus a reserve of strength and rigidity to provide for the stresses that may be applied during the dismantling operation.

Care shall be taken to prevent the overloading of scaffolds and the following maximum loadings shall not be exceeded:

(i) The live load on any light duty working platform shall not at any time exceed a load equivalent to 350 lb concentrated at 9 feet intervals along the length of the scaffold.

(ii) The live load on any heavy duty working platform shall not at any time exceed a load equivalent to a total of 80 lb per foot length of the platform distributed evenly over the length of the platform together with loads of 350 lb concentrated at 9 feet intervals along the length of the platform.

(iii) The live load on any special duty working platform shall not at any time exceed a load equivalent to the safe working load for the platform.

All scaffolding shall be of sound material and if to exceed 25 feet in height it must be erected only under the supervision of a person holding a certificate of competency for that kind of scaffold.

Following completion of the erection of the scaffold a register must be completed, signed by the person carrying out the examination of the scaffold and left on the worksite.

Where there is a danger of materials falling onto workmen or the public below, the entire face of the scaffold

must be covered with scrim or small mesh netting. Where public thoroughfares pass alongside these scaffolds catch screens must be provided covered with suitable protective material. These scaffolds must be illuminated during the hours of darkness if in a darkened area and where situated adjacent to public thoroughfares be provided with warning notices of ample size clearly stating that demolition work is in progress and danger exists.

No scaffolding shall be permitted to remain free standing following the removal of supporting walls unless its base equals one third or more its height or it is dog-leg braced to ground level with adequate bracing.

1.7.02 **Provision of Material Chutes**

Where material is to be lowered by other than mechanical means steel or timber chutes shall be provided to comply with the requirements as laid down in 1.1.03.

1.7.03 **Control of Dust in Built-up Areas**

Most demolition work creates large volumes of dust which in windy, busy or densely populated areas can create a danger to vehicular traffic and result in injury to persons lawfully in the vicinity.

Watering down of debris including loaded vehicles must be carried out as the work proceeds.

Chapter 8

PLANT

Mechanical plant of all descriptions is now used extensively on most construction works. This applies to demolition work and includes the use of the following plant. Mobile cranes, bulldozers, front-end loaders, compressors, compressed air gear, and motor-trucks for the removal of materials.

1.8.00 **Legal Requirements**

Section 14 of the Construction Act states that the following rules shall be observed in respect of mechanical plant used in connection with construction work, e.g. demolition work.

(a) All such mechanical plant shall be constructed of suitable and sound materials, shall be maintained in good order and condition, and shall be of adequate strength having regard to the purpose for which it is to be used.

(b) Mechanical plant of a kind or class prescribed in that behalf by regulations under this Act shall not be erected, altered, interfered with, or dismantled except by competent

workmen under the charge of a person having such qualifications as may be so prescribed.

(c) Mechanical plant to which paragraph (b) of this section applies shall be examined in accordance with and at such times as may be prescribed by regulations under this Act and a record of all such examinations shall be kept by the employer and the record shall be available for inspection by the Inspector at the site of the work.

(d) Mechanical plant of a kind or class prescribed in that behalf by regulations under this Act shall not be operated or left in charge of any person except a person having such qualifications as may be so prescribed.

1.8.02 **Mobile Cranes**

Mobile cranes used on demolition work whether for lifting purposes or demolition with a ball, shall be of adequate strength having regard to the weight of the ball, the shock loadings implied, the safe load capabilities of the jib and stability of the crane. They shall be set up on solid level ground with clearances from all live overhead power-lines as required under the Electrical Supply Regulations 1962, Regulation 82.

Mobile cranes must not be used for the breaking loose of foundation beams, column bases or other section where due to friction or other causes the load being placed upon the crane is unknown.

Outriggers shall be used at all times where heavy lifting is to be carried out.

Where two cranes are used for the lowering and transporting of very heavy materials special precautions must be taken. Ground conditions must be level and solid and a constant equal load must be maintained on each machine.

Where a dogman is assigned to the operation of a mobile crane he shall be experienced in the safe securing of loads and be fully conversant with the standard signal system. (See illustration.)

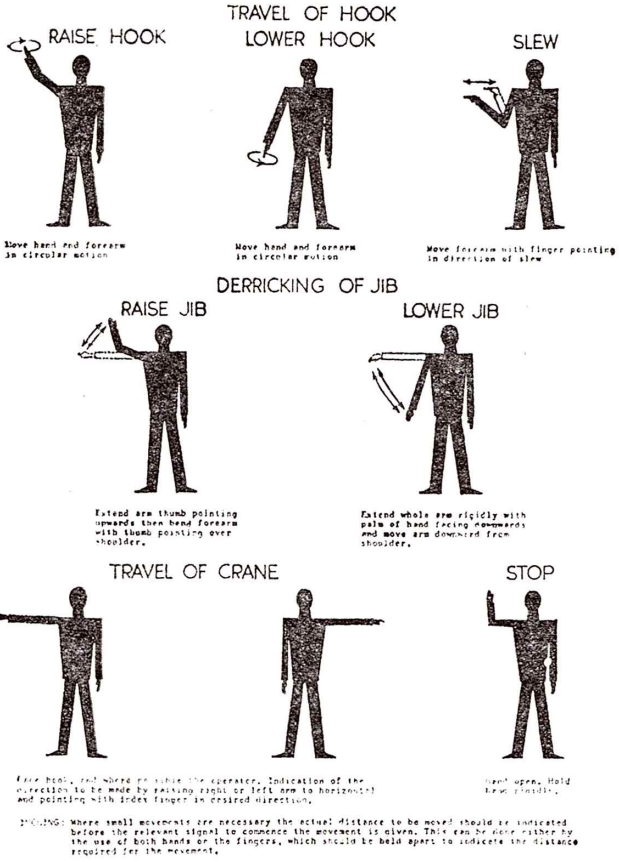
No beam or section shall be cut until precautions have been taken to prevent it from swinging freely and possibly striking a workman or other part of the structure. No person shall ride the hook or load unless approval has been obtained in writing from the Safety Inspector.

Whenever acetylene or oxygen cylinders are transported or lifted by crane they shall be placed in suitable cradles. All structural steelwork shall be lowered from the building and never allowed to drop.

1.8.03 **Demolition Ball-Work**

This can be very hazardous if the crane has not been designed with this in view. Many manufacturers do not recommend the use of their cranes for demolition ball or "captive ball" demolition service, or may only approve

HAND SIGNALS
MOBILE CRANES


TRAVEL OF HOOK
LOWER HOOK
RAISE HOOK
SLEW
Move hand and forearm in circular motion
Move hand and forearm in circular motion
Move forearm with finger pointing in direction of slew
DERRICKING OF JIB
RAISE JIB
LOWER JIB
Extend arm thumb pointing upwards then bend forearm with thumb pointing over shoulder.
Extend whole arm rigidly with palm of hand facing downwards and move arm downward from shoulder.
TRAVEL OF CRANE
STOP
Open palm, Hold
Index finger,
POINTING: Where small movements are necessary the actual distance to be moved should be indicated before the relevant signal to commence the movement is given. This can be done either by the use of both hands or the fingers, which should be held apart to indicate the distance required for the movement.

Reprinted from N.Z.S.R. 5: 1965. Hand Signals for the Control of Cranes.

this use conditionally, such as with a restriction in jib length and weight of ball to be used. In all cases demolition ball service is restricted to machines designed for that purpose or to machines designed for arduous or heavy-duty such as cranes convertible to dragline excavators.

If the crane is not of the type convertible to a dragline excavator, the contractor or owner must have a certificate from the manufacturer stating under what conditions it can be used for demolition ball service. If this cannot be produced then the crane will not be regarded as of adequate strength for the purpose and will not comply with Section 14 (a) of the Construction Act and its use will be prohibited.

Under no circumstances should "side-swinging" ball techniques be used. This imposes excessive side loadings for which the jib has not been designed. An anti-spin device or a tag-line should always be fitted on the hoist rope when using a demolition ball.

In all cases the demolition ball shall only be used when the crane is stationary and standing on firm level ground.* The equipment should be used from outside a building and not from the inside. Jib derricking should not be employed for the purpose of swinging the ball. The operator should be experienced and skilled in the use of the equipment and technique of demolition. There must be a high standard of inspection and maintenance. The hoist rope anti-spin device and ball attachment shall be inspected by a competent person not less than twice daily.

Care must be taken to avoid the ball becoming trapped as a sudden collapse of the structure could overload the crane. If the ball does become trapped it should be lowered off before freeing as any dragging or lifting action might cause the structure to prematurely collapse or the loading to be excessive and overturn the crane.

Any damage to the crane must be reported and remedied at once. Distortion of any member of jib, etc., or nicking of any steel member can lead to a collapse.

1.8.04 **Restriction on Use of Cranes and Other Machines Near Overhead Electric Lines**

There must be strict compliance with the Electrical Supply Regulations 1962, which states:

"The minimum distance between a conductor of any live overhead electric line and any mechanical or power operated or mobile or adjustable crane, hoist, boom derrick, mast, shovel, excavator, scoop, loader, conveyor belt,

FOOTNOTE—

* If pneumatic tyred, outriggers to be fully extended and well chocked. Outrigger blocks to give as greater degree of bearing as possible.

earth-boring equipment, drilling rig, pile-driver, ditch-digger, dragline, or other similar device or any part thereof (not owned by an electrical supply authority and under the control of a competent person), or any load thereon shall be 12 feet.

It shall be the duty of the Electrical Supply Authority or other licensee of any overhead electric line, on enquiry being made by the owner or operator of any such device as aforesaid, to inform him in writing of the voltage of the line and of the appropriate minimum distance as specified in this regulation. The provisions of this subclause shall not apply where the operator of any such device is employed in the lines branch of the Post Office or by an Electrical Supply Authority."

1.8.05 **Bulldozers and Front-end Loaders**

Where bulldozers or front-end loaders are used on demolition work the following requirements shall apply:

(a) They shall be under the charge of competent operators skilled in this class of work.
(b) Operators shall wear protective headgear at all times.
(c) The machine shall be fitted with an overhead protective canopy metal or mesh suitable for the purpose.
(d) Where the machine is fitted with a rear winch and it is used for the pulling over of walls, columns, etc., it shall be fitted with a rear shield of sufficient strength to protect the operator against snapping of the pulling cable and possible whip-back.
(e) Where machines are to operate on upper floors the load-bearing qualities of the floors must be ascertained and be capable of safety withstanding any impact loads caused by the operations of the machine.

1.8.06 **Compressors—Compressed Air Work**

The use of compressors on demolition work shall comply with all requirements applying to pressure vessels as laid down under the Boilers Lifts and Cranes Act 1950 and the Construction Act 1959.

A Certificate issued by the Secretary of Transport must where possible be exhibited in some conspicuous place where it can be readily seen by all persons working at or with the compressor. This certificate must be renewed annually.

The moving parts of any compressor, i.e. fan-blades, must be suitably guarded to prevent injury to operator's hands when adjusting or operating the machine.

Air hoses must be maintained in good condition and when in use all joints must be securely locked together.

Skylarking with compressed air and compressed air hoses must not be permitted. Compressed air easily penetrates the human skin or body openings and can cause fatal injuries.

Where demolition work is carried out with the use of compressors, compressed air gear or other mechanical plant and ventilation is restricted, precautions must be taken for the removal of engine fumes by the use of scrubbers or other exhaust systems. Safety glasses and respirators must be worn while working in these confined areas.

Chapter 9

DEMOLITION

1.9.00 Dropping of Loads onto Floors

Masonry walls or other sections of masonry shall not be permitted to fall upon the floors of the building in such masses as to exceed the safe working load of the floor.

Structural or load supporting members of any floor shall not be cut or removed until all storeys above such a floor have been demolished and removed.

Any floors cut for the disposal of materials or weakened by demolition operations and intended to carry further loads shall be tommed to safely carry the intended imposed loads.

1.9.01 Disposal of Waste Material

No material shall be dropped (by gravity) to any point lying outside the exterior walls of the building except through enclosed wooden or metal chutes.

All material chutes which are at an angle of more than 45° from the horizontal shall be entirely closed on all four sides except for the openings at or about floor level for the receiving of materials. All chute openings below the top storey shall be kept closed when not in use. Chutes at an angle of less than 45° to the horizontal may be left open on the upper side, provided that at the point where such a chute discharges into a chute steeper than 45° with the horizontal the top of the steeper chute shall be boarded over to prevent the escape of materials.

A strong gate shall be installed in each chute at or near the discharge end and a workman shall be designated to control the gate and the backing up and loading of trucks. When operations are not in progress the danger area at the discharge end of the chute shall be completely fenced or otherwise made inaccessible. All materials of a dusty nature when loaded on trucks for transport and disposal shall be, prior to removal, thoroughly dampened down to prevent nuisance and injury to the public.

Demolished materials, debris or spoil shall not be allowed to accumulate on any floor of the structure or on any scaffolding if the weight of the materials exceeds the

safe carrying capacity of the scaffold or floor of the structure. Such materials, debris or spoil shall be so piled or stacked that it will not endanger workmen, other persons or impose a load on walls or columns.

All roads and excavations shall be properly secured or fenced when demolition work has ceased for the day or completely.

1.9.02 **Housekeeping**

During demolition, chutes, floors, stairways and other places shall be sprinkled frequently to keep down dust if necessary.

Where possible stairs shall be kept in place, free from debris and in usable condition as long as is practicable.

All footpaths, roadways and other surfaces used by the public and workmen must be kept clear of rubbish and materials at all times.

Chapter 10

EXPLOSIVES

1.10.00 **Construction Blaster**

Regulation 100 of the Construction Regulations 1961 requires that no blasting operations shall be carried out on construction work unless the person who prepares and lays the charge ready for firing is the holder of a certificate of competency as a construction blaster applicable to the type of blasting being carried out. This means that any person using explosives on demolition work must have a certificate of competency as a construction blaster applicable to that kind of work.

1.10.01 **Certificate of Competency**

An applicant for a certificate of competency as a construction blaster, before being granted a certificate, shall comply with the following requirements:

(a) He shall have had adequate experience in the preparation charging, tamping and firing of explosives and suitable experience in blasting operations on construction work;

(b) He shall have a thorough knowledge of safe practices in blasting and of the provisions of the Act and Regulations thereunder as far as these provisions apply to construction work involving blasting operations;

(c) He shall have passed such practical tests and examinations as may be required by the examiners for the purpose of being satisfied that the applicant has complied with the provisions of paragraphs (a) and (b) of this clause.

The examination for a certificate of competency as a construction blaster shall include questions relating to each of the following topics:

(a) The types and classifications of explosives and their strength and uses:

(b) The use of safety fuse, primers, electric firing, detonating fuse, and accessories, and the laying of charges preparatory to blasting;

(c) Safety precautions in blasting operations, including the protection and warning of the public, the protection of property, system and order, control of flying rock, precautions in respect of electrical firing, and misfire procedures;

(d) Secondary blasting, popping, cutting and demolitions;

(e) The storage, handling, and destruction of explosives, detonators, and fuse;

(f) The enactments of New Zealand relating to explosives prescribed in that behalf in an approved guide.

A certificate of competency under this regulation may be granted in respect of such categories of construction work and shall apply to such kinds of blasting operations as may be specified in the certificate.

1.10.02 **General Safety Measures**

The following general safety measures shall apply in respect of blasting operations in construction work:

(a) The blaster in charge of or carrying out the operations shall ensure that sound and accepted practices are followed in respect of:

(i) The selection and use of explosives, detonators, and fuse as suitable for the purpose for which they are being used;

(ii) The handling, holding, and storage of explosives and accessories on the site of the construction work;

(iii) The layout of the blast and the preparation, charging and tamping of shots;

(iv) The connection and testing of lines and circuits;

(v) The prevention of undue scatter and of damage to property;

(vi) The procedure in cases of misfires and the disposal of surplus or unused explosives, detonators, and fuse.

(b) The safety supervisor of any construction work in which blasting operations are carried out shall ensure that:

(i) When these regulations so provide, only the holder of a certificate of competency as a construction blaster is employed in the preparation and laying of charges ready for firing;

(ii) All practicable steps are taken to guard against danger to persons and property in the vicinity of the blast;

(iii) Proper warning signals are given before the blast and all-clear signals after the blast;

(iv) Explosives, detonators, and fuses are at all times under proper care and custody and, when not in use, are returned to an explosives magazine or placed in a securely locked storage place on the site of the work;

(v) Blasts are fired only when all practicable steps have been taken to clear the danger area;

(vi) The agreed all-clear signal is given after the blaster and the safety supervisor have taken all practicable steps to ascertain that conditions are safe at the site.

(vii) The provisions of an approved guide or code relating to safety in blasting operations on construction work are complied with.

The following rules shall be observed in the handling, carriage, holding, and storage of explosives and detonators on and in the vicinity of construction work sites:

(a) Only sufficient quantities of explosives and detonators for daily use shall be brought to the immediate vicinity of the blasting operations;

(b) Detonators and explosives shall at all times be kept in separate containers and kept apart until the final stages are reached for making up the charge ready for firing;

(c) Explosives, detonators, and fuse shall be suitably protected from the weather, kept a safe distance from vehicular and pedestrian traffic, and from mechanical, physical, and electrical hazards;

(d) All practicable precautions shall be taken in the care and custody of detonators and explosives, particularly when in broken lots and not in the original containers, to avoid unauthorised interference or access by children or other persons;

(e) Temporary storage, carriage, and handling on and in the vicinity of construction work sites shall be in accordance with safe practices as approved by the Chief Safety Engineer;

(f) Transport of explosives and detonators to construction work base depot and long-term magazine storage at the depot shall be in accordance with the requirements of the Chief Inspector of Explosives under the Explosives Act 1957.

1.10.03 **Blasting General**

It is the purpose of the Blasting Code of Practice to provide all necessary information to enable the contractor to effect safe working conditions under normal circumstances. However, all persons engaged in blasting should determine whether there are existing local body requirements which are applicable and, if so, shall be strictly adhered to.

SAFETY IN CONSTRUCTION PUBLICATIONS

Obtainable from any Office of the Department of Labour.

No. 1—A Short Guide to the Construction Act 1959.
No. 2—(Now included in No. 4).
No. 3—Scaffolding Code of Practice.
No. 4—Blasting Guide.
No. 5—Excavation Code of Practice.
P No. 6—First-Aid Practice on Construction Work.
P No. 7—First-Aid Facilities on Construction Work.
P No. 8—Underground Public Services.
P No, 9—Scaffolding Certificates and Examinations.
No. 10—(Reserved).
P No. 11—The Care, Use and Maintenance of Timber Ladders on Construction Work.
No. 13—(Reserved).
P No. 14—Trench Collapse on Construction Work.
No. 15—Under-water Diving Code of Practice.
No. 16—Powder-powered Tool Guide.
P No. 17—Safe Practices for Mobile Crane Operation.
No. 18—Work in Compressed Air Code of Practice.
No. 19—Construction Foreman's Guide to Safety Supervision.
No. 20—Safe Use of Electricity.

(P means a folded pamphlet of 4–12 pp.)

As at March 1974.

DISTRICT OFFICES OF THE DEPARTMENT OF LABOUR

Whangarei	Masterton
AUCKLAND	LOWER HUTT
	WELLINGTON
HAMILTON	Blenheim
Tauranga	Nelson
	Greymouth
ROTORUA	CHRISTCHURCH
	Timaru
Gisborne	
NAPIER	
Hastings	
NEW PLYMOUTH	DUNEDIN
Wanganui	
PALMERSTON NORTH	INVERCARGILL

District Offices shown in capitals are headquarters of Safety Inspectors appointed under the Construction Act 1959. These Inspectors serve in addition the other related districts grouped above with their headquarters.